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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,493	12/09/2003	Rahmi Hezar	TI-36192	4606

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EXAMINER

YOUNG, BRIAN K

ART UNIT	PAPER NUMBER
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2819

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,493

Applicant(s)

HEZAR, RAHMI

Examiner

Brian Young

Art Unit

2819

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-9,11,15-18 and 21 is/are rejected.
- 7) ☒ Claim(s) 2-5,10,12-14,19,20 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/9/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/9/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,6-9,11,15-18 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson.

Claim 1 recites “an analog to digital conversion system, comprising: a first quantizer providing a first quantized output according to a system analog input and according to a noise shaped feedback signal, a second quantizer coupled with the first quantizer and providing a second quantized output according to the first quantized output, the system analog input, and the noise shaped feedback signal, and a digital noise shaping system coupled with the first and second quantizers and providing the noise shaped feedback signal according to the second quantized output, the noise shaped feedback signal being noise shaped by the digital noise shaping system with respect to a quantization error associated with the first quantizer”.

Claims 8,9 further add the limitation that the “noise shaping system” is a “bandpass filter”.

Independent claim 16 further recites that “delta sigma modulation” is utilized.

Jackson ‘353 specifically discloses a (his title) “**Bandpass sigma-delta analog-to-digital converter (ADC)**, method therefor, and receiver using same”.

Jackson recites (col.1) "FIG. 1 illustrates in partial block diagram and partial logic diagram form a bandpass sigma-delta analog-to-digital converter (ADC) 10 according to the present invention. ADC 10 includes generally a first bandpass sigma-delta modulator 11, a second bandpass sigma-delta modulator 12, and a digital filter 13". Jackson further recites (col.4) "First bandpass sigma-delta modulator 11 converts analog signal 14 into intermediate analog signal 15 and first digital signal 16 by receiving analog signal 14 in a coefficient buffer 19. A second coefficient buffer 28 receives an output of a digital-to-analog converter (DAC) 27 of modulator 11. A first summing device 21 combines an output of coefficient buffer 19 with an output of coefficient buffer 28. A first bandpass filter 22 receives an output of summing device 21. Bandpass filter 22 is ideally an infinite-quality (Q), second-order bandpass filter described by the transfer function $(z \cdot \sup{-1} / (1 + z \cdot \sup{-2}))$ as illustrated in FIG. 1. Bandpass filter 22 has for a center frequency that is exactly one-fourth the sample frequency of modulator 11. A coefficient buffer 23 receives an output of bandpass filter 22 and provides an output to an input of a second summing device 24. A second input of summing device 24 receives an output from a coefficient buffer 32. A second bandpass filter 25, having the same transfer function as first bandpass filter 22, receives the output of second summing device 24, and has an output for providing intermediate analog signal 15. A **first quantizer 26** has an input for receiving the output of second bandpass filter 25, and an output for providing first digital signal 16, which is the digital output of modulator 11. Second bandpass sigma-delta modulator 12 converts intermediate analog signal 15 into second

digital signal 17, and receives intermediate analog signal 15 at an input of a coefficient buffer 33. A third summing device 34 has inputs for receiving an output of coefficient buffer 33 and an output of a coefficient buffer 41, and an output for providing an input to a third bandpass filter 36. Bandpass filter 36 has the same transfer function as bandpass filters 22 and 25. A **second quantizer 37** has an input for receiving an output of bandpass filter 36, which it converts into digital form and provides as digital signal 17 at an output thereof. A delay element 38 has an input for receiving the output of quantizer 37, and an output.

As for the limitation that a noise shaped feedback is used to correct for quantization error from the first quantizer. Jackson recites (col. 3) “ An analog input signal is received, and a first predetermined fraction of the analog input signal is summed with the first predetermined fraction of a first feedback signal to provide a **first error signal**”. The first error signal is bandpass-filtered to provide a first intermediate analog signal. The first intermediate analog signal is quantized to provide a first digital signal”.

Claims 6 and 7 further recite the limitation that the quantizer/ filter is implemented with switched capacitors. Jackson recites (col. 1) “Aside from the feedback DAC, the basic sigma-delta ADC may be implemented with conventional analog components such as operational amplifiers, comparators, and **switched-capacitor filters**”.


3. Claims 2-5,10,12,13,14,19,20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Thurston and Pearce disclose delta-sigma type ADC's having bandpass filtering.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Young whose telephone number is 571-272-1816. The examiner can normally be reached on Mon-Fri 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Brian Young
Primary Examiner
Art Unit 2819

bky